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*Word Formation Strategies in the Hebrew Verb System:
Denominative Verbs*

by

Shmuel Boložky



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WORD FORMATION STRATEGIES IN THE HEBREW VERB SYSTEM: DENOMINATIVE VERBS

by

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A hierarchy is suggested for the familiar syntactic and semantic factors determining realization of Hebrew verbs in the particular conjugations. Other considerations apply whenever applicable: no realizations are allowed which would form unpronounceable clusters; realizations preserving the consonant clusters of original nouns are preferred; if a slot is occupied, the semantically-closest conjugation is chosen. To examine these claims, native speakers were asked to themselves innovate denominative verbs, or make judgements about hypothetical verbalizations. The results support the basic semantic/syntactic hierarchy; speakers even invent new devices allowing incorporation of non-syntactic and non-semantic factors without the hierarchy itself being significantly affected.

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1. INTRODUCTION *

When a linguist is introduced to the morphological system of a Semitic language, his first reaction is quite enthusiastic: here is the ultimate productivity in a morphological system! This enthusiasm soon dissipates when he finds out how many exceptions and unaccountable forms the system actually contains.

Obviously, Semitic morphological systems are neither fully regular nor totally irregular. This paper attempts to put the productivity of one aspect of Hebrew morphology in the right perspective—the formation of denominative verbs—and establish a tentative hierarchy of the variety of factors involved. Traditional and recent approaches to Hebrew verb morphology are mentioned first, with particular reference to syntactic and semantic classifications, but it is shown that phonetic and phonological considerations play a role as well. Recent verbalizations are then separately examined, and precedence relations are tentatively established. Finally, the claims for these precedence relations are examined in terms of the behaviour of fifty native speaking subjects when asked to themselves innovate denominative verbs or make judgements about hypothetical verbalizations.

2. TRADITIONAL AND RECENT APPROACHES TO HEBREW VERB MORPHOLOGY

2.1. THE CONJUGATIONS OF THE VERB

When a noun is verbalized in Hebrew, a decision has to be made as to what conjugation of the verb it is to be realized in. Below I briefly review the nature of traditional verb-morphology in Hebrew in terms of the existing conjugations. Hebrew (usually tri-consonantal) roots can be realized in one or more of seven morphological verb-patterns or conjugations (*binyanim*),¹ with the following stem forms: CaCaC, ni+CCaC, CiCeC, CuCaC,

*I wish to thank Ruth Aronson Berman, Gad Ben-Horin, Daniel Boyarin, Peter Cole, Gabi Hermon, Ora Schwarzwald and Yael Ziv for their valuable comments on this paper.

¹Native nouns, adjectives etc. also follow morphological patterns (*miškalim*). The difference is, that the number of *miškalim* is far greater than the number of *binyanim*, and while verbs can ONLY be realized in one or more of the seven *binyanim*, borrowed nouns and adjectives are usually introduced as they are, regardless of existing native *miškalim*.

hit+CaCeC, *hi+CCiC*, and *hu+CCaC*. Each of these conjugations has been claimed to either carry its own independent syntactic function, or at least denote a core (or a number of cores) of meaning common to groups of verbs realized in it. Even today school grammars continue to assume roughly the same semantic characterization of the *binyanim* offered for Biblical Hebrew in the Nineteenth century, and to a large extent even by grammarians of the Middle Ages. Below is a list of independent syntactic functions attributed to the *binyanim* in a typical school grammar:

| (1) NAME OF BINYAN | TRADITIONAL SYNTACTIC FUNCTION | EXAMPLES |
|---------------------------|---|--|
| <i>pa'al</i> ² | unmarked base form | |
| <i>niʕal</i> | passive of <i>pa'al</i> | <i>nišlax</i> ³ 'be sent' passive of <i>šalax</i> 'send' |
| <i>pi'el</i> | normally transitive | <i>sider</i> 'arrange' |
| <i>pu'al</i> | passive of <i>pi'el</i> | <i>sudar</i> 'be arranged' |
| <i>hitpa'el</i> | middle voice, normally intransitive counterpart of <i>pi'el</i> or <i>pa'al</i> | <i>hitlabeš</i> ⁴ 'get dressed' |
| <i>hiʕil</i> | normally transitive | <i>hixtiv</i> 'dictate' |
| <i>huʕal</i> | passive of <i>hiʕil</i> | <i>huxtav</i> 'be dictated' |

Cores of meaning common to groups of verbs realized in a particular conjugation are usually arranged in a markedness hierarchy, i.e. if more than one core of meaning is noted, the most likely (unmarked) meaning is listed first:

| (2) BINYAN NAME | MEANING | ILLUSTRATIONS |
|-----------------|---|---|
| <i>niʕal</i> | change of state | <i>nidlak</i> 'turn on (light, int.)' vs. <i>dalak</i> 'be on (light)' |
| <i>pi'el</i> | intensified form of <i>pa'al</i> | <i>šiber</i> 'smash', intensified form of <i>šavar</i> 'break' |
| <i>hitpa'el</i> | reflexive change of state (inchoative) reciprocal | <i>hitraxec</i> 'wash (oneself)' <i>hitraxev</i> 'widen (int.)' <i>hitvarxu</i> 'they argued' |
| <i>hiʕil</i> | causative change of state (inchoative) | <i>higdil</i> 'enlarge (tr.)' <i>hichiv</i> 'become yellow' |

Obviously, many variations on this classification may be found, but the classes above seem to be mentioned by ANY school grammar.

²The root *pʕl* (historically *pʕl*) has been used traditionally as a prototype, *p* indicating the first radical of the root, *ʕ* the second, and *l* the third.

³Stress is indicated only when not final. All verbs are represented in the morphologically most basic form—Third Person Masc. Sing., Past Tense, unless otherwise specified. Thus, *nišlax* 'be sent' actually means 'he/it was sent' and *sider* 'arrange' actually means 'he arranged'.

⁴For clarity of representation, glottals will be represented in these cases, though phonetically they are not realized before unstressed vowels.

2.2. THE PRODUCTIVITY OF BINYAN MEANING AND SYNTACTIC FUNCTION

Linguists describing Modern Hebrew are aware of the fact that the "independent" syntactic functions of the *binyanim* are still quite productive, though some are more productive than others. The active/passive relationships are very productive in the case of *piʔel/puʔal* and *hiʔil/huʔal*, but less so in the case of *paʔal/niʔal*. As far as transitivity is concerned, *niʔal* and *hitpaʔel* are typically non-transitive—i.e. do not take *ʔet* NP (*ʔet* is the definite object marker); *piʔel* and *hiʔil* are typically transitive; and *paʔal* is neutral in this respect. The only significant change affecting the traditional system in (2) above has been the replacement of *paʔal* by *piʔel* as the productive, unmarked form—which was first noted by Sivan (1963). It is possible that *paʔal* being neutral with respect to transitivity was one of the reasons for its almost ceasing to be productive, though there must have been at least another two reasons for it: the fact that it could not accommodate quadriliterals and quintiliterals, and most of its slots being occupied already. I know of only two recent denominative *paʔal* verbs, one transitive, the other intransitive: *gamaz* 'criticize severely', from *gāmu* 'proper name of a vitriolic Israeli critic' and *xarap* 'nap' from *xrop* 'nap (N)', from Yiddish. The latter started from *xrop* > *laxrop* 'to nap', owing to phonetic similarity of the noun to the infinitival form, which developed into *xarap* by a sort of back-formation. I also heard *lidrop* 'to drop (a course)' among Israeli students in the States, which may develop through similar back-formation into *darap*. Ora Schwarzwald also reports (personal communication) that in the Hebrew of Israeli kids in the States, one hears *laput* 'to put' and *tinok* 'knock', which behave like "hollow" *paʔal* verbs. So *paʔal* is not yet "dead". Generally in the speech community, however, its productivity is very restricted.

All in all, however, the observations concerning the productivity of the *binyan* syntactic functions are generally true. On the other hand, the productivity of the specialized meanings of the *binyanim* is necessarily restricted, since these specialized meanings characterize limited groups of verbs within each *binyan*. Although there might be some disagreement between Schwarzwald (1975) and Berman (1975b) on how minor the redundancy rules expressing these predictions will be, it is generally agreed (cf. primarily Ornan 1971 and Schwarzwald 1975) that predicting meanings of forms on the basis of specialized semantic groups in the *binyanim* is a complicated matter. First of all, as Schwarzwald points out, only 2.3% of listed roots occur in all seven conjugations, and 41% of those are homonymous—i.e. realization of a phonological root in some conjugation may be utterly unrelated semantically to its realization in another conjugation (for instance, *sarat* 'scratch' and *hisrit* 'film'). Furthermore, even among non-homonymous roots, the meaning relations often do not develop as expected (for instance, *hizmin* 'order, invite'—one would hardly expect *hizdamen* to mean 'occur, come by chance', *hitpaʔel* often being reflexive, reciprocal, etc.). Numerous examples like these are cited in the literature on the subject. It would appear that the percentage of verbs one can classify into expected classes is small enough to make the meaning groups quite minor.

What Ornan (1971) concludes from this state of affairs is that semantic productivity is no longer a property of the verb-system, except for the active-passive relationship of *hiʔil/huʔal* and *piʔel/puʔal*. To the best of my knowledge, this strong version of the non-productivity claim has never been accepted by other linguists describing the Hebrew verb system. There seems to be ample evidence around for at least some degree of productivity: recent formation of verbs, mistakes made by children and other learners of the language, and systematic and almost-free innovative capability of adult speakers to express themselves in an original and "creative" manner by readily coining hypothetical verbs (as is evident in the tests reported in this paper), which are comprehended by other speakers with no difficulty at all. What is normally debated is not the very existence of this productivity, but how it should be described, and the description may sometimes be quite subtle, as in the case of Cole's (1976) description of causatives in Hebrew.

Appendix I contains a brief discussion of some recent literature on realization of roots in the different *binyanim*.

3. THE INTERACTION OF FUNCTIONAL, SEMANTIC AND PHONOLOGICAL CONSIDERATIONS IN DENOMINATIVE VERBALIZATION

This paper concentrates on only one aspect of the productivity of the verb system: formation of new verbs from existing nouns and adjectives, whether borrowed or native. There are other aspects of productivity—like the realization of roots in *binyanim* in which they had not formerly been used (e.g. *hizrik* 'inject', *hictalem* 'have one's picture taken'), onomatopoeic innovations, (e.g. *tirter* 'make noise', *tiktek* 'tick'), and so on. I will restrict myself to denominative verbs, however, as they constitute the most productive source of new verbs in the language, as Sivan (1963) earlier noted, and because there is usually no question as to the form from which these verbs were originally derived. Note that when realized as verbs, borrowed nouns are subject to the same rules and constraints as native ones—e.g. *bilef* ('lie', from *blof* 'lie (N)', from English *bluff*) ~ *bilfa* 'she lied' ~ *biläfti* 'I lied', compared with native *mikem* ('place' from *makom* 'place (N)') ~ *mikma* 'she placed' ~ *makämti* 'I placed'.

Although Sivan and Berman have already introduced most of the factors involved in verb formation, including those determining formation of denominative verbs, neither of them attempted to establish a hierarchy, or priority of importance, among the different types of factors involved.

Obviously, however, the innovator must impose SOME hierarchy on the relevant factors and establish precedence relations. In the rest of the paper I will try to show how these precedence relations are reflected in RECENT verbalizations of nouns and adjectives, and then in productivity tests.

3.1. PRECEDENCE RELATIONS IN RECENT VERBALIZATIONS

3.1.1. The Realization of Most Quadriliteral and Quintiliteral Nouns

Pronounceability seems to be the initial consideration. Thus, verbalization of most quadriliteral or longer nouns would have created an unpronounceable cluster in *hiḥ'il* (e.g. **hitripid* from *torpēdo*, **hikftir* from *kaftor* 'button', **hipnčir* from *pānčer* 'puncture, flat tire, mishap'), in *hiḥ'al* (e.g. **nitrpad*, **nikftar*, **nipnčar*) or in (the future of) *pa'al*⁵ (**titripod*, **tikftor*, **tipnčor*), owing to the basic stem-initial cluster of these *binyanim*, to the fact that the stem-final consonant cannot be expanded into a cluster throughout the verb-stem,⁶ and to their stems being monosyllabic. Such nouns can be realized in either *pi'el* (e.g. *kifter*) or *hitpa'el* (e.g. *hitkafter*). The stems of those, unlike the ones of *hiḥ'il* and the future of *pa'al*, are disyllabic in their unmarked⁷ forms, and more consonants can thus be accommodated. If the verb is transitive, it will be realized in *pi'el*, since *hitpa'el* is typically intransitive. Thus, *torpēdo* is verbalized as *tirped*,

⁵*pa'al* has almost ceased to be productive anyway—as explained in 2.2 above.

⁶I am aware of one exception, in child language, viz. *hišvūgg* 'he ran very fast', from *švūgg* 'impetus'. This is due both to *gg* functioning like a single segment and to the attempt to preserve as much as possible of the original form of the noun.

⁷That is, without any additional inflectional affixes marking such bound categories as non-third person, non-singular (= plural) number, non-masculine (= feminine) gender.

- | | | | | | |
|-----|----------------|------------------|---|---------------|------------------|
| (3) | <i>kaftor</i> | 'button (N)' | > | <i>kifter</i> | 'button' |
| | <i>pānčer</i> | 'mishap' | > | <i>pīnčer</i> | 'cause a mishap' |
| | <i>ʔaxzava</i> | 'disappointment' | > | <i>ʔixzev</i> | 'disappoint' |

and so on, and each of those will have a parallel passive counterpart in *puʔal* and usually a middle-voice corresponding *hitpaʔel*:

- | | | | | | |
|-----|---------------|----------------------|---|--------------------|----------------------------|
| (4) | <i>kuftar</i> | 'be buttoned' | > | <i>hitkafter</i> | 'button up' |
| | <i>torpad</i> | 'be torpedoed' | > | <i>ʔʔhittarped</i> | 'fail (intr.)' |
| | <i>punčar</i> | 'be caused a mishap' | > | <i>hitpančer</i> | 'fail because of a mishap' |
| | <i>ʔaxzav</i> | 'be disappointed' | > | <i>hitʔaxzev</i> | 'become disappointed' |

The same would apply to most nouns containing four consonants or more which are realized as transitive verbs. If, however, the verb is basically intransitive, without a corresponding transitive and middle voice, it may be realized EITHER as *piʔel* or as *hitpaʔel*, since while the latter is typically intransitive, the former may be either transitive or intransitive. In such cases one must refer to the more specific meanings denoted by groups of verbs within the *binyanim*. Thus, if the noun is to be realized as an independent inchoative, reflexive or reciprocal,⁸ the choice is *hitpaʔel*:

- | | | | | | |
|-----|---------------|---------------|---|-------------------|--|
| (5) | <i>ʔezrax</i> | 'citizen' | > | <i>hitʔazrēax</i> | 'become a citizen' |
| | <i>pirxax</i> | 'hoodlum' | > | <i>hitparxēax</i> | 'become, begin to act like, a hoodlum' |
| | <i>pulmus</i> | 'controversy' | > | <i>hitpalmes</i> | 'argue about' |

For all other intransitive verbs, *piʔel* is chosen:

- | | | | | | |
|-----|-----------------|-----------------|---|----------------------------|------------------|
| (6) | <i>tafkid</i> | 'job, function' | > | <i>tifked</i> ⁹ | 'function' |
| | <i>xantariš</i> | 'nonsense' | > | <i>xintreš</i> | 'speak nonsense' |
| | <i>têlêfon</i> | 'telephone (N)' | > | <i>tîlfen</i> | 'telephone' |

This is the normal procedure for realizing most nouns containing four consonants or more—though not for all of them, as will be seen below.

Note that the generalizations claimed apply to ANY noun or adjective that is verbalized, whether native or borrowed, old or new: old borrowed nouns (*pulmus* 'controversy', Greek), newly borrowed nouns (*torpêdo*, *têlêfon*), native nouns (*tafkid* 'function', *pirxax* 'hoodlum'), slang nouns, whether borrowed (*xantariš*, Arabic) or native (*hitparper* 'fool around', from *parpar* 'one who fools around', from 'butterfly'). Also, as explained above, once a noun or adjective is verbalized, it behaves like an original verb in every respect, regardless of its source.

3.1.2. Verbalization of Triliteral and Biliteral Nouns and Adjectives

If no phonetic difficulties are involved to start with, transitivity is less useful as a

⁸Or, of course, if the form can only be realized in *hitpaʔel* because this is the only *binyan* that allows a pronounceable configuration, e.g. the five consonants in *dizengof* (name of street) can only be verbalized as *hizdangeš* 'go up and down Dizengoff Street'.

⁹Gad Ben-Horin has pointed out to me that in sports, *tifked* may be used transitively, meaning 'assign role (by coach)'.

criterion: *piʿel*, though often transitive, is not always so (e.g. *bilef* 'lie' and *kiter* 'complain' below), and *hiʿil*, which is normally transitive too, has a group of intransitive verbs, essentially inchoatives (e.g. *hivrid* 'become pink' and *hišmin* 'become fat' below). Since *paʿal* and *huʿal* do not normally exist independently of corresponding *piʿel* and *hiʿil* forms, it is again impossible to choose a *binyan* merely on the basis of whether a transitive or intransitive verb is to be formed. *Paʿal* being neutral with respect to transitivity does not help either. Since transitivity cannot be very useful in determining verbalization of trilateral nouns, one has to resort to the meaning groups within the *binyanim*. The picture that emerges somewhat resembles the one introduced at the beginning of the paper, with certain changes and further specifications.

3.1.2.1. Intransitive Denominative Trilaterals

Inchoatives-over-colours, i.e. 'become colour', and inchoatives-over-physical-human-qualities, i.e. 'acquiring a particular physical (human) quality', are realized in *hiʿil*. This was a typical *hiʿil* characteristic in Biblical Hebrew already—cf. *hilbin* 'become white' etc. Innovations follow an existing semantic group, then:

- | | | | | |
|-----|---------------|------------------------|--|------------------------------------|
| (7) | <i>hivrid</i> | 'become pink' | | (cf. <i>varod</i> 'pink') |
| | <i>hišxim</i> | 'become brown, tanned' | | (cf. <i>šaxum</i> 'brown, tanned') |
| | <i>hišmin</i> | 'become fat' | | (cf. <i>šamen</i> 'fat') |
| | <i>hirza</i> | 'become thin' | | (cf. <i>raze</i> 'thin') |

The last two are recent colloquial innovations, replacing literary *paʿal* counterparts, *šamen* and *raza* respectively. Since no recent inchoatives have been realized in *niʿal*, probably owing to the almost-zero productivity of *paʿal*, to which *niʿal* is often related, all other recent inchoatives and ingressives denoting 'change-of-state', 'becoming', etc., are realized in *hitpaʿel*, e.g.:

- | | | | | | |
|-----|--------------|----------------|---|-----------------|-----------------------------|
| (8) | <i>yadid</i> | 'friend' | > | <i>hityaded</i> | 'befriend, become friendly' |
| | <i>pēger</i> | 'cadavre' | > | <i>hitpager</i> | 'die' |
| | <i>šavac</i> | 'heart attack' | > | <i>hištavec</i> | 'have a heart attack' |
| | <i>xatix</i> | 'good looking' | > | <i>hitxatex</i> | 'become handsome' |

In *hitpaʿel* are also realized all middle-voice counterparts of transitive verbs realized in *piʿel*, including reflexive, inchoative or reciprocal actions:

- | | | | | | |
|-----|----------------|-----------------|---|-----------------|--|
| (9) | <i>meʾrkaz</i> | 'center' | > | <i>hitrakez</i> | 'concentrate, int' ~ <i>rikez</i> 'concentrate (tr.)' |
| | <i>mamaš</i> | 'real, reality' | > | <i>hitmameš</i> | 'be realized, become a reality' ~ <i>mimeš</i> 'realize (tr.)' |
| | <i>zā(y)in</i> | 'penis' | > | <i>hizdaynu</i> | 'they engaged in coitus' ~ <i>ziyen</i> '"lay" (a woman)' |

Other intransitive verbs, i.e. non-inchoative (or non-ingressive), non-reflexive, non-reciprocal, etc., are realized in *piʿel*, which is the unmarked *binyan* for innovations. Thus,

- | | | | | | |
|------|--------------|-------------------------------------|---|--------------|------------|
| (10) | <i>blof</i> | 'bluff, lie (N)' | > | <i>bilef</i> | 'lie' |
| | <i>kūter</i> | 'cat, one who complains like a cat' | > | <i>kiter</i> | 'complain' |
| | <i>nājes</i> | 'a nag' | > | <i>nījez</i> | 'nag' |
| | <i>koxav</i> | 'star (N)' | > | <i>kixev</i> | 'star' |

As we saw above, the same also applies to quadriliteral roots or quintiliteral ones that could not be realized in *hiḡʔil* for phonetic reasons, but which would have been pronounceable in *hitpaʔel*:

- (11) *taḡkid* 'job, function' > *tiḡked* 'function'
xantariš 'nonsense' > *xintreš* 'speak nonsense'

**hitḡkid* and **hixntriš* would not have been pronounceable, but **hittaḡked* and **hitxantreš* are. Semantically, however, they do not belong in *hitpaʔel*.

3.1.2.2. Transitive Denominative Triliterals

Note that whereas for quadriliteral nouns, owing to problems of pronounceability, transitive realization was normally in *piʔel*, the realization of triliteral nouns as transitive verbs is more of a problem, since both *piʔel* and *hiḡʔil* may be transitive. Furthermore, transitive verbalizations in both *binyanim* may have a causative sense; and in deriving verbs from nouns and adjectives, one expects to find lots of causatives.

One of the common causative uses of *hiḡʔil* is 'cause somebody to do something', e.g.

- (12) *rakad* 'dance' ~ *hirkid* 'cause (somebody) to dance'
gašav 'sit down' ~ *hošiv* 'cause (somebody) to sit down'
kašac 'jump' ~ *hikpic* 'cause (somebody) to jump'

To form new causatives of this type, one would usually take some existing verb, normally realized in *paʔal* or sometimes in *niḡʔal* (see Ariel (1972) in Appendix I), and have it realized in *hiḡʔil*:

- (13) *taram* 'contribute' ~ *hitrim* 'cause (somebody) to contribute'
ʔazav 'leave' ~ *heʔeziv* 'make (somebody) quit (slang)'
dahar 'gallop' ~ *hidhir* 'make (a horse) gallop'
xatam 'sign' ~ *hextim* 'have (somebody) sign'

Since, however, we are dealing with new verbs derived from nouns or adjectives, such causatives are irrelevant to this paper.

On the other hand, we ARE interested in existing denominative *hiḡʔil* verbs with the causative-over-inchoative meaning 'cause to become N/Adj.', like:

- (14) *mēlex* 'king' > *himlix* 'make (someone) king'
gadol 'big' > *higdil* 'make (something) big'
xalaš 'weak' > *hexliš* 'make (someone) weak'

Interestingly enough, although one finds many existing causatives in *piʔel* which also mean 'cause to become Adj.', like

- (15) *xazak* 'strong' > *xizek* 'strengthen (tr.)'
kacar 'short' > *kicer* 'shorten (tr.)'
xam 'hot' > *ximen* 'heat'

recently-formed denominative causatives meaning 'cause to become N/Adj.', or 'make into N/Adj.' (i.e. causatives-over-inchoatives) indicate preference for *hiʕil*:

- | | | |
|--|---|---|
| (16) <i>xariʕ</i> 'sharp' | > | <i>hexriʕ</i> 'sharpen (tr.)' |
| <i>muxaši</i> 'real, tangible' | > | <i>himxiš</i> 'make real, tangible' |
| <i>nicxi</i> 'eternal' | > | <i>hincīax</i> 'eternalize' |
| <i>taʕel</i> 'tasteless, without salt' | > | <i>hitpīl</i> 'desalinate' |
| <i>kveč</i> 'very soft (slang)' | > | <i>hikvič</i> ¹⁰ 'squeeze, cause to be very soft (child speech)' |
| <i>maxaze</i> 'play' | > | <i>himxiz</i> 'he made (novel, etc.) into a play' |
| <i>pnīm</i> 'inside (N)' | > | <i>hiʕnīm</i> 'he internalized' |

Also, one observes tendencies in children to shift denominative causatives of this type from *piʕel* into *hiʕil* (the first is heard in sub-standard adult speech as well):

- | | | |
|---|---|---|
| (17) <i>kerev</i> 'draw (something) nearer' | > | <i>hikriv</i> (cf. <i>karov</i> 'near') |
| <i>kiʕer</i> 'make (someone) ugly' | > | <i>hiʕir</i> (cf. <i>mexoar</i> 'ugly') |

If the notion 'causative' is restricted to 'cause to BECOME', i.e. causatives-over-inchoatives, and 'cause (someone) to DO something' (like *hirkid* 'cause to dance' etc.), then all non-causative transitive triliteral nouns and adjectives are realized in *piʕel*. I cannot tell, however, whether this generalization is captured as such, or speakers follow more specific semantic categorization extracted from groups of verbs within *piʕel*, like 'put, place in N', as in (18i), or 'use, or bring about use of N', as in (18ii):

- | | | |
|--------------------------------|---|---|
| (18) (i) <i>makom</i> 'place' | > | <i>mikem</i> 'put in place' |
| <i>moked</i> 'focus (N)' | > | <i>miked</i> 'focus' |
| <i>ʔamud</i> 'page' | > | <i>ʔimed</i> 'arrange in pages' |
| <i>šuk</i> 'market (N)' | > | <i>šivek</i> 'market' |
| <i>tik</i> 'file (N)' | > | <i>tiyek</i> 'file' |
| <i>bama</i> 'stage' | > | <i>biyem</i> 'stage (a play)' |
| (ii) <i>gēšer</i> 'bridge (N)' | > | <i>gišer</i> 'bridge (a gap)' |
| <i>mexona</i> 'machine' | > | <i>miken</i> 'mechanize' |
| <i>vasat</i> 'regulator' | > | <i>višet</i> 'regulate' |
| <i>mamon</i> 'money' | > | <i>mīmen</i> 'finance' |
| <i>mokeš</i> 'mine (N)' | > | <i>mikeš</i> 'mine' |
| <i>griz</i> 'grease (N)' | > | <i>gerez</i> 'grease' |
| <i>zāyin</i> 'penis' | > | <i>ziyen</i> '"lay" (a woman)' |
| <i>dēgel</i> 'flag' | > | <i>digel</i> 'present arms (like flag)' |

¹⁰Ora Schwarzwald also reports having heard *kiveč* and *kivčeč* from *kveč* [personal communication].

(18) cont.

| | | | | |
|--------------|-----------------------|---|--------------|--------------------|
| <i>yāʔar</i> | 'wood' | > | <i>yīʔer</i> | 'cover with trees' |
| <i>bul</i> | 'stamp' ¹¹ | > | <i>biyel</i> | 'stamp (envelope)' |
| <i>ʔiš</i> | 'man (N)' | > | <i>ʔiyēš</i> | 'man' |
| <i>ʔot</i> | 'letter' | > | <i>ʔiyet</i> | 'spelled' |

and so on. Most other transitive denominative verbs which do not (or are hard to) classify into semantic groups are also realized in *piʔel*, which again emerges as the unmarked *binyan*. Thus:

| | | | | |
|---------------------|----------------|---|---------------|---------------------|
| (19) <i>pizm+on</i> | 'tune' | > | <i>pizem</i> | 'hum a tune' |
| <i>navat</i> | 'navigator' | > | <i>nivet</i> | 'navigate' |
| <i>nativ</i> | 'trail, route' | > | <i>nitev</i> | 'mark trail, route' |
| <i>xuga</i> | 'dial (N)' | > | <i>xiyeg</i> | 'dial' |
| <i>sēmel</i> | 'symbol' | > | <i>simel</i> | 'symbolize' |
| <i>dūax/dox</i> | 'report (N)' | > | <i>divēax</i> | 'report' |
| <i>vaday</i> | 'certain' | > | <i>vide</i> | 'validate' |

3.1.3. Occupied Slots

Besides the above considerations, possible realizations are checked against existing items, and if the slot concerned is already occupied, the innovator normally chooses the semantically-closest *binyan* in which the slot is still free. Thus, for instance, the adjectives *pašut* 'simple' and *matun* 'moderate' can not be realized as causative-over-inchoative verbs in *hiʔil*, as predicted from the procedure above, since there already exist *hiʔil* realizations for both of these roots—*hiʔšit* 'take off (someone's) clothes' and *himtin* 'wait'. The innovator resorts to the other transitive *binyan*, *piʔel*: *pišet* 'simplify', *miten* 'cause to be moderate'.

Sometimes the occupied-slot consideration coincides with the semantic choice of *binyan*. For instance, *nēcax* 'eternity' is realized as *hincīax* 'eternalize' because in *piʔel*, *nicēax* is an existing item meaning 'win, conduct', and *tafel* 'tasteless, without salt' becomes *hitpil* 'desalinate' because of the existence of *tiʔel* 'take care (of somebody)'; at the same time, both are assigned to *hiʔil* by virtue of being causative.

3.1.4. Additional Phonological Factors

3.1.4.1. Glides as Second Radicals in *hiʔil*

In addition to the unpronounceability of most quadriliterals (and longer) nouns in *binyanim* other than *piʔel*, *puʔal* and *hitpaʔel*, there are also language-particular restrictions on certain sequences of consonants which force choice of one *binyan* over another. Thus, a

¹¹The fact that *bul*, *ʔiš* and *ʔot* are realized with glides indicates that they are conceived as originating from 'defective' roots in which the glides are not realized in certain environments. Ruth Berman comments [personal communication] that derivations like *bul* > *biyel* being so common in spite of their apparent opacity to the native speaker proves that "defective" glides are still viable in the morphology of Modern Hebrew.

noun like *xayal* 'soldier' would be expected to be realized as a *hiḡʔil* causative, but since except for one word, *hexya* 'he revived', Hebrew glides are not realized as second radical in *hiḡʔil*, *y* would be expected to delete, as it normally does in *hiḡʔil*: the *hiḡʔil* realization of the root *k-w-m* is *hekīm* 'raise', that of *b-y-n*: *hevīn* 'understand', and so on. The form *hexil*, however, is already occupied ('cause to apply' or 'hope', or even 'contain', if the orthography is ignored), and furthermore, the original noun *xayal* would hardly be recognized. So the other transitive *binyan* is chosen, and we get *xiyel* 'he mobilized, enlisted'.

Note that realization of biliteral nouns as transitive verbs in *piʔel* rather than *hiḡʔil* can partly be explained by the same constraint. In those cases where *y* is introduced, like *tik* > *tīyek*, *ʔot* > *ʔīyet*, that *y* will be unacceptable in *hiḡʔil*, for the same reason that **hixyil* was ruled out, and if that *y* were NOT introduced, the resulting *hiḡʔil* forms would have been confused with forms with deleted /n/, e.g. /hinpil/ 'he caused to fall' > *hipil*. Could it be said, then, that all biliteral nouns (also *sūk* > *šīvek* and *dūax* > *diveax*, where historical *w* is realized as *v*) are automatically realized in *piʔel* for that reason? It may very well be true, if the requirement for deletion of glides as second radicals in *hiḡʔil* can be firmly established. The existence of *hexya* above and *hexvir* 'become pale', from *xīver* 'pale' (*v* originating from historical *w*) indicate, however, that this requirement is not absolute. Note again that these "defective" glides are not as opaque as generally assumed to be (see Berman's comment, footnote 11).

3.1.4.2. No Stem-Geminates

One would have expected *mamašī* 'real' > *himmiš*, but Hebrew, though permitting geminates across morpheme-boundary, does not allow them stem-internally. Instead, we get *mīmeš* 'realized, tr.', then.

3.1.5. Sporadic Analogies

It sometimes happens that a certain noun or adjective is verbalized in some *binyan*, and then another two or three nouns of the same semantic field follow, even though the meaning relationship is not precisely the same (or has specialized in some unexpected manner). Thus *maxaze* 'play' > *himxiz* 'he made (novel, etc.) into a play', which was realized in *hiḡʔil* by virtue of being a true causative, probably¹¹ triggered *sēret* 'movie' > *hisrit* 'he shot, or projected, a movie' and *lāxan* 'tune' > *hīlxin* 'he composed a tune'. It seems to me that **siret* (or **seret*) and **lixen* would have been chosen if not for the analogy with the realization of *maxaze* as *himxiz*, since they are not causatives semantically.

3.1.6. Preserving the Structure of the Original Noun/Adjective

Earlier it was noted that quadriliteral (or longer) nouns are not always necessarily realized in *piʔel* (or *puʔal* or *hitpaʔel*, for that matter). Generally they ARE realized in *piʔel* (or *puʔal*, or *hitpaʔel*), since realization in *hiḡʔil* is often quite unpronounceable, owing to the stem-initial consonant cluster characteristic of *hiḡʔil*, *niḡʔal*, and the Future of *paʔal*. Note, however, that among recent verbalizations, one finds at least two quadriliterals that are realized in *hiḡʔil*:

- | | | | | | |
|------|--------------|--------------------|---|----------------|--------------------|
| (20) | <i>špric</i> | 'squirt' | > | <i>hišpric</i> | 'he squirted' |
| | <i>švuḡg</i> | 'impetus (colloq)' | > | <i>hišvūḡg</i> | 'he ran very fast' |

¹²To the best of my knowledge, *himxiz* indeed preceded both *hisrit* and *hīlxin*. However, since ALL of the three are innovations, I have not been able to verify this yet.

This happens in spite of the second being intransitive and the first non-causative transitive (with an underlying object).

The reason is quite simple: *pi²el*, i.e. *šiprec and *šiven_g, would have broken the consonant clusters of the original nouns and rendered them unrecognizable. Yet innovation prefers the origin of the denominative verb to be as transparent as possible, and since consonants are essential for recognition of meaning (the original vowels are gone away—replaced by the *binyan* vowels), breaking consonant clusters is avoided if possible. Thus, original VOWELS can freely be deleted—for instance, *tilfen* 'he telephoned' gets rid of extra vowels in the source noun *tēlefon* without seriously affecting its recognition, but the špr cluster of consonants in špric remains unaffected. Obviously, the stem-*i* of *hiḡ²il* makes it even easier to recognize špric in *hišpric*, but preserving the original vowel is not that essential. Note that in a sense, the reluctance to break clusters in špric and švu_g can be interpreted as assignment to biliteral roots: špr-c and šv-_g.

Similarly, we have some trilateral nouns recently verbalized in *hiḡ²il* where *pi²el* realization would have been expected:

- | | | | | | |
|------|-------------|------------|---|---------------|---------------|
| (21) | <i>ḡlik</i> | 'blow' | > | <i>hiḡlik</i> | 'give a blow' |
| | <i>šmir</i> | 'blow' | > | <i>hišmir</i> | 'give a blow' |
| | <i>ḡloc</i> | 'fart (N)' | > | <i>hiḡlic</i> | 'fart' |
| | <i>švic</i> | 'bragging' | > | <i>hišvic</i> | 'brag' |

The first two are non-causative transitive, and the other two intransitive. Obviously realization in *hiḡ²il* is intended to keep the original consonant sequences of the source-nouns as transparent as possible.

At least for borrowed words, then, we have a tendency on the part of innovators to preserve the relationship between nouns and verbs derived from them, so as to have a kind of paradigmatic uniformity across syntactic categories. This tendency may even result in morphological processes affecting a *binyan* so as to allow preservation of original consonant clusters. Thus, since *ḡlirt* 'flirt' cannot be realized as **hiḡlirt* (because according to the procedure for quadrilateral intransitives outlined above it does not belong there and because—except for *hišvu_g*, where *ng* is conceived as a single segment—verb-stems cannot end with a cluster of two consonants), it can only be realized in *pi²el*. However, since realization as **ḡlirt* would obliterate the original clustering of consonants in the noun, the innovator resorted to reduplication of the last consonant and sticking the stem-final vowel in between the two identical consonants—*ḡlirtet* 'flirt (V)'. Thus he avoided a *hiḡ²il* realization and at the same time managed to preserve the original noun intact. Reduplication is an accepted device in Hebrew, used largely to express diminution—both in the verb system, for instance *cixkek* 'giggle' vs. *caxak* 'laugh', and elsewhere (*varod* 'pink' vs. *vradrad* 'pinkish'). Indeed, *ḡlirtet* may be interpreted as some sort of diminutive—but I suspect that this interpretation did not trigger its formation: **ḡlirt* would have been diminutive as well, 'flirt' in itself being a diminutive of 'making love'. In other words, it was the need to preserve *ḡlirt* that caused reduplication, and the diminutive interpretation is redundant.

That the diminutive interpretation is not the triggering factor in such cases can be proved by similar reduplication cases involving trilateral nouns (no other recent verbalizations involving nouns like *ḡlirt* are available):

- | | | | | | |
|------|--------------|---------|---|---------------|-----------------|
| (22) | <i>siḡra</i> | 'digit' | > | <i>siḡrer</i> | 'assign digits' |
|------|--------------|---------|---|---------------|-----------------|

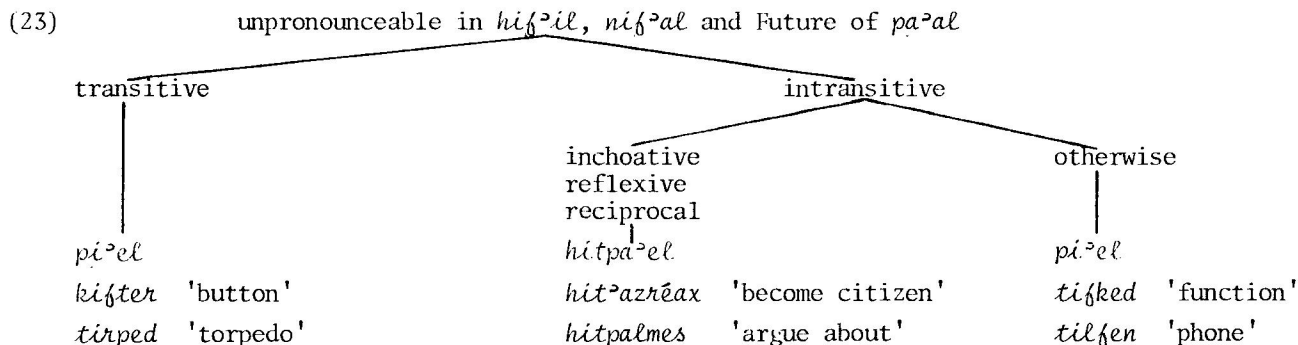
| | | | | |
|---------------|----------|---|-----------------------------|--|
| <i>toxnit</i> | 'plan' | > | <i>tixnen</i> ¹³ | 'plan' |
| <i>boks</i> | 'box' | > | <i>hitbokses</i> | 'box (with someone) (slang)' |
| <i>kurs</i> | 'course' | > | <i>hitkarses</i> | 'take a course (slang)' |
| <i>kunc</i> | 'trick' | > | <i>kincec</i> | 'play a trick (literary, rather rare)' |

Except for the literary *kincec*, perhaps, no diminutive sense is implied. It might be argued that normal *piʔel* realization would not have been possible because of occupied slots—*siper* and *tiken* respectively (the second radical of *piʔel* is normally *p*, *b*, *k* rather than *ḥ*, *v*, *x*); still, **bikes*, **keres* and **kinec* would have been "free" for the realization of *boks*, *kurs* and *kunc* respectively.

Reduplication is quite productive in the language (cf. Bolozky (1972)).¹⁴ Among denominative verbs, however, the number of reduplication cases is quite limited. It is impossible, however, to evaluate the significance of this fact, since verbalized nouns with initial and final consonant clusters are not at all common in Hebrew, and all (or most) of those that exist do preserve the original consonant clusters. Is this significant or accidental? It seems that the best way to test it would be by productivity tests.

3.2. A Proposal for a Verbalization Hierarchy

To sum up the picture that emerges from recent verbalization of nouns and adjectives, the following general diagram might be suggested:



¹³ *tixnet* has a different meaning—'he programmed'. *+it* in *toxnit* is a suffix.

¹⁴ Especially for colour terms and a few other adjectives, meaning '... ish', as in:

| | | | | |
|--------------|---------|---|-----------------|------------|
| <i>kaxol</i> | 'blue' | > | <i>kxalxal</i> | 'bluish' |
| <i>yarok</i> | 'green' | > | <i>yerakrak</i> | 'greenish' |
| <i>šamen</i> | 'fat' | > | <i>šmanman</i> | 'fattish' |

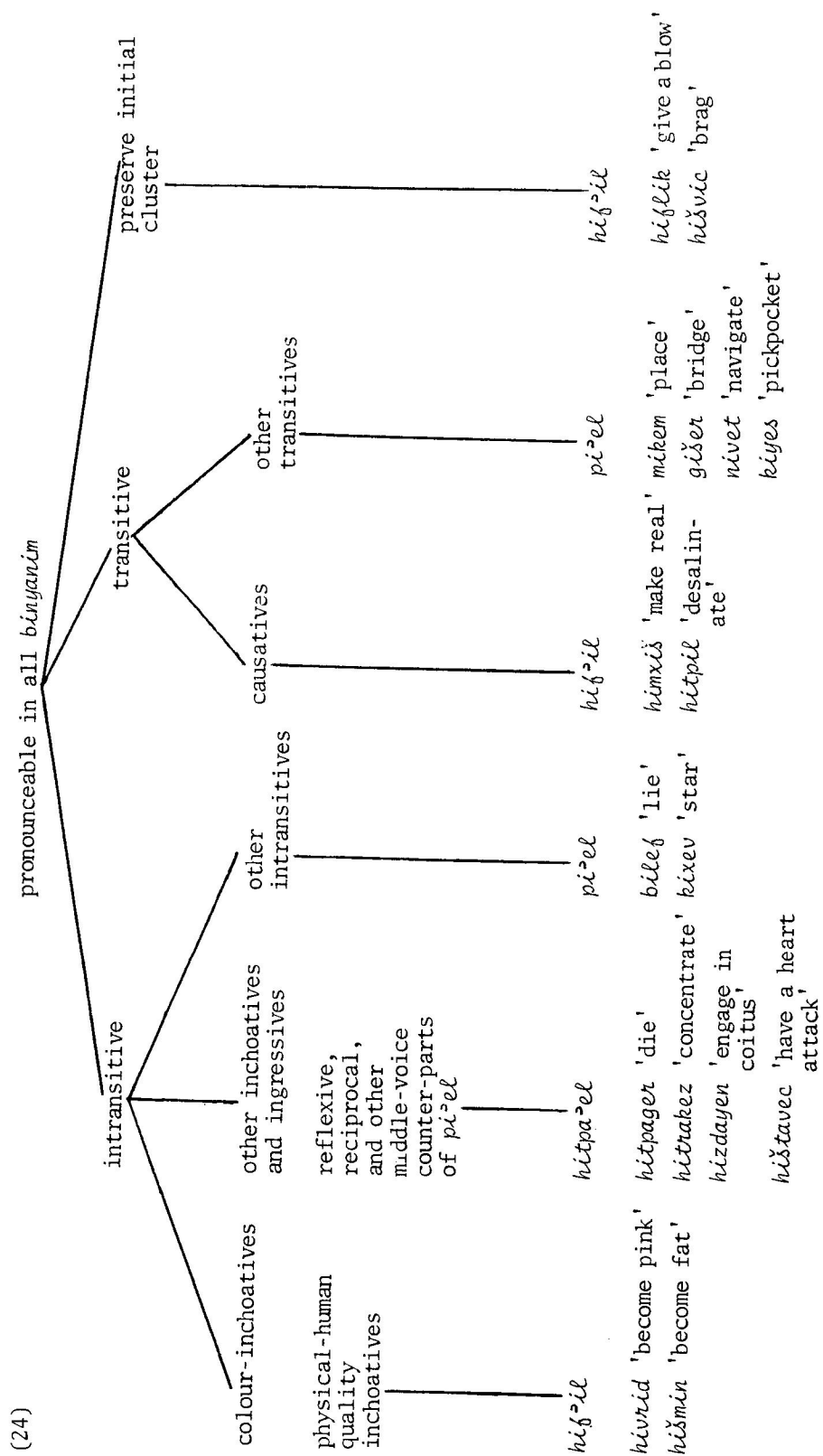
for diminution in animal words, as in:

| | | | | |
|--------------|-------|---|-----------------|----------|
| <i>kēlev</i> | 'dog' | > | <i>klavlav</i> | 'doggy' |
| <i>xatul</i> | 'cat' | > | <i>xataltul</i> | 'kitten' |

for some verbs, especially onomatopoeic:

| | | | | |
|---------------|--------|---|---------------|--------|
| <i>cilcel</i> | 'ring' | > | <i>zinzem</i> | 'buzz' |
|---------------|--------|---|---------------|--------|

and so on.

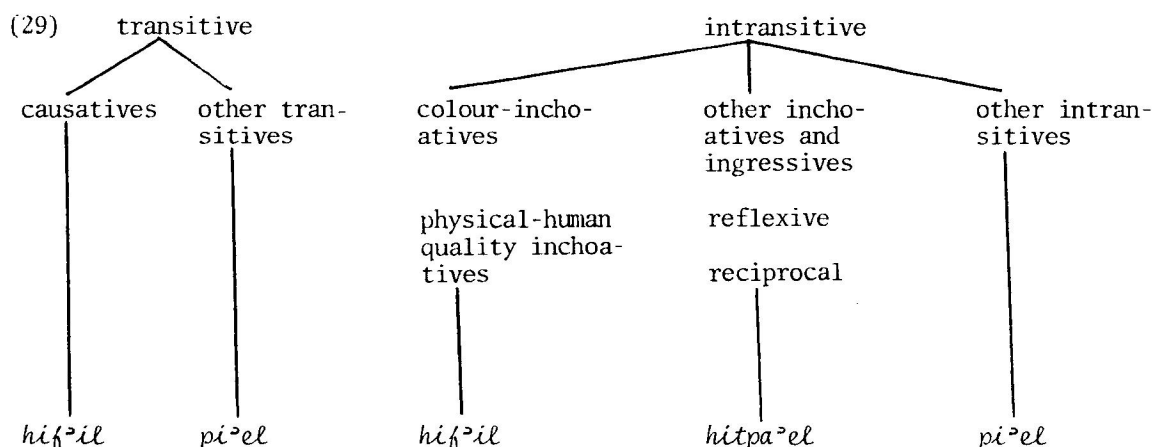


- (25) Unordered factors, applying whenever applicable:
- (i) Avoid unpronounceable sequences, or sequences disallowed in Hebrew
 - (ii) Avoid "occupied" slots
 - (iii) If possible, preserve original consonant sequences of source N/Adj.
- (26) Sporadic factor—analogy with some limited semantic group
- (27) Automatic derivation:
- (i) transitive *piʔel* > *puʔal*

| | | | | |
|---------------|----------|---|---------------|---------------|
| <i>kifter</i> | 'button' | > | <i>kufʔar</i> | 'be buttoned' |
| <i>mikem</i> | 'place' | > | <i>mukam</i> | 'be placed' |
 - (ii) transitive *hiʔil* > *huʔal*

| | | | | |
|---------------|--------------|---|---------------|------------------|
| <i>himxiš</i> | 'make real' | > | <i>humxaš</i> | 'be made real' |
| <i>hitpil</i> | 'desalinate' | > | <i>hutpal</i> | 'be desalinated' |
- (28) Frequent derivation: transitive *piʔel* > middle voice in *hitpaʔel*
- | | | | | |
|--------------|---------------------|---|-----------------|----------------------|
| <i>rikez</i> | 'concentrate (tr.)' | > | <i>hitrakez</i> | 'concentrate (int.)' |
| <i>mimeš</i> | 'realize (tr.)' | > | <i>hitmameš</i> | 'realize (int.)' |

Note that since the unordered factors do not have to be included in the diagram, the section for "unpronounceable in *hiʔil*" can be dispensed with. The branching in it is identical to the "pronounceable in all *binyanim*" diagram—with *hiʔil* and the cluster-preservation branch excluded. (25i), however, will automatically exclude unpronounceable realization in the former and (25iii) will take care of the latter. (23) and (24) can be collapsed into (29), then (since derivation of middle-voice *hitpaʔel* from transitive *piʔel* is also almost automatic, reference to middle voice is unnecessary as well):



4. PRODUCTIVITY TESTS OF VERBALIZATION OF NOUNS AND ADJECTIVES

To find out whether trends emerging from recent denominative verbs are still productive, four productivity tests were run with fifty native Hebrew-speaking participants (most of whom were students at teacher training colleges) for each type of test.

4.1. TESTS ISOLATING THE SYNTACTIC AND SEMANTIC FACTORS

The first two tests were constructed in such a way as to (hopefully) exclude the phonetic and clash-with-existing-items factors, in an attempt to single out the semantic and syntactic considerations. The nouns selected were triconsonantal, and contained no consonant clusters that might cause reduplication or use of extended patterns. Furthermore, they were almost all non-native, to avoid the otherwise-almost-unavoidable clash with already existing, or at least possible, forms—though it is inconceivable, of course, that one would be able to COMPLETELY avoid any sort of interference by association, or sporadic analogy with some existing verb or some small group of verbs. The first test was supposed to invoke "active" formation of denominative verbs; to represent the innovator's point of view, subjects were given only the noun and target meaning of the verb it should be realized as. The second was intended to represent the more "passive" acceptance and rejection by the speech community of proposed innovations: various verbalized forms of the same noun were suggested (in addition to the noun and target meaning), and subjects were asked to choose the one that will best characterize the given meaning. Although the best testing method would have probably been exclusively oral throughout, the need to simultaneously propose alternative realizations for each item in the second test made it quite impractical. To avoid interference of spelling considerations as much as possible, and still maintain a uniform method for the two tests, nouns and given meanings were introduced orally, but the answers proposed in test II (subjects were asked to re-write their choice) and subjects' own formations in test I were all in writing. A few subjects were given a sample of test I as intended, and a few days later a sample of the same test conducted orally throughout, and the results showed no significant difference.

In test I, the nouns were read aloud, paraphrased target meanings were suggested (translated in table I), and subjects were asked to fill in their suggested realization for corresponding verbs in very short sentence frames prepared beforehand (cf. Appendix II), with complete representation of diacritic vowel marks.¹⁵ Given meanings related to the same noun were not consecutively ordered (they are in the table, for convenience). No strict time limit was set, but reading of nouns was not repeated at request.

The same method was used in test II, except that below each of the prepared sentence-frames a few alternative verbal realizations were proposed (in Hebrew script). These forms were also read aloud, but subjects could see them all at the same time.

The number of subjects was always fifty, though the total of answers was often less than fifty, owing to subjects' inability to make a decision in some cases. The numbers in the table are doubled to give percentages. To save space, the results of test II are incorporated in brackets in the table for test I.

¹⁵It took some time to explain that one should not worry about certain distinctions among the diacritical vowel marks which no longer have a distinctive phonetic function in Modern Hebrew. Subjects were told that they could use, for instance, either *kamac* or *patax* (both of which stand for *a*) as long as they used ONE.

Results of Tests I and II

| No. | Noun, Meaning/Target-Meaning | CiCeC, including ʔi+CCeC | hi+CCiC | hit+CaCeC | ní+CCaC or CaCaC |
|-----|--|--------------------------------|----------------|-----------------------------|---------------------|
| 1 | šēriḡ 'sheriff'/'he made him a sheriff' | šireḡ 20 (16) ʔišreḡ 6 | hišriḡ 72 (82) | | (šaraḡ-2) |
| 2 | šēriḡ 'sheriff'/'he became a sheriff' | | hišriḡ 4 | hištareḡ 90 (100) | |
| 3 | šēriḡ 'sheriff'/'he made himself, proclaimed himself, sheriff' | | | hištareḡ ^{1 6} 100 | |
| 4 | šēriḡ 'sheriff'/'he served as sheriff' | šireḡ 74 (68) | hišriḡ 6 (10) | hištareḡ 16 (20) | (šaraḡ-2) |
| 5 | vasal 'vassal'/'he made someone a vassal' | visel 40 (48) | hivsil 60 (52) | | |
| 6 | vasal 'vassal'/'he became a vassal' | | hivsil 2 (2) | hitvasel 94 (98) | nivsal 2 |
| 7 | vasal 'vassal'/'he lived as a vassal' | visel 70 (82) | | hitvasel 24 (18) | |
| 8 | salōni 'an armchair revolutionary' (from <i>salon</i> 'parlour')/'he caused someone to become an armchair revolutionary' | silen 34 (30) | hislin 66 (70) | | |
| 9 | salōni as above /'he became an armchair revolutionary' | | hislin 2 (4) | histalen 94 (96) | nislan 4 |
| 10 | salōni as above /'he spoke like an armchair revolutionary' | silen 56 (52) | hislin 2 (6) | histalen 36 (42) | |
| 11 | panel 'panel'/'he covered with panels' | pinel 68 (76) | hiḡnil 30 (24) | | |
| 12 | kēres 'hook'/'he fitted with a hook' | keres 66 (70) | hikris 30 (30) | | |

^{1 6}Most subjects explained afterwards that they would have preferred a causative verb plus a reflexive pronoun, i.e. *hišriḡ ʔet ʔacmo* 'he made sheriff (of) himself', but since the instructions called for single-word verbs, they had to resort to *hitpaʔel*.

I was not able to find a colour or physical-human-quality trilateral non-native word to see whether it would tend to be realized in *hiʕʔil*; otherwise the results roughly confirm the findings summarized above for recent verbalizations. Thus, causatives (i.e. examples 1, 5, 8) are realized in *hiʕʔil* more often than in *piʔel*—although this is obviously not a universal trend, which might indicate that with *piʔel* having become a base form, it is more productive even for this type of causative than what actually emerges from recent verbalizations. Other transitives are realized in *piʔel*, as is illustrated by 11 and 12. Intransitive inchoatives, other ingressesives and reflexives are realized in *hitpaʔel* with almost no exceptions (cf. 2, 3, 6, 9), and other intransitives in *piʔel* (cf. 4, 7, 10), though here it might be that *hitpaʔel* is more productive for these other intransitives than what emerges from recent verbalizations.

The results of Test II were not different from those of the first test in any significant way—except for a STRONGER tendency in most cases towards forms already preferred in the previous test, probably since exposure to it strengthens the subject's confidence in the appropriateness of the choice. One case where the tendency weakened was the causative realization of *vasal*. I think that the stronger preference for *visel* here (which incidentally is my own choice too) is due to a certain preference for *piʔel* realization of literary nouns.

4.2. TESTS INVOLVING INITIAL AND FINAL CONSONANT CLUSTERS

Testing whether pronounceability would in fact cause most quadrilaterals to go into *piʔel* was trivial. Obviously, if a verb simply could not be pronounced in *hiʕʔil*, it would go into *piʔel* or *hitpaʔel*. In the third test, then, the nouns used contained three or more consonants with clusters in initial and/or final position, which phonetically could be realized in either *piʔel*, *hitpaʔel* or *hiʕʔil*. The idea was to check three things: (a) whether the choice of *binyan* as established in the two previous tests may be affected in any way so as to allow preservation of the original clusters; (b) whether within a *binyan*, variants preserving original clusters would have preference; and (c) whether the restriction noted above on stem-final clusters in the verb (i.e. that a stem-final consonant cannot be expanded into a cluster, e.g. *torpēdo* > **hitripd*) would be maintained even when original clusters are involved.

The fourth test was, again, the same as the third, except that alternative forms were suggested as verbalizations of given nouns and given meanings, and speakers were asked to choose rather than "create". The assumption was, once more, that the "active" test would reflect innovative capacity while the "passive" one would recreate the normal situation of speakers hearing innovations and rejecting or accepting them by intuition.

The Results of test IV are incorporated in the table for test III below, in brackets.

Results of Tests III and IV

| No. | Noun, Meaning/ Target Meaning | % of CáCeC and extensions | Distribution of CáCeC forms | <i>hi+CCáC</i> | % of <i>hit+CaCeC</i> and extensions | Distribution of <i>hit+CaCeC</i> forms |
|-----|--|---------------------------------|--|---------------------------|---|---|
| 1 | <i>snob</i> 'snob'/'he made him snob- bish' | 40 (36) | <i>sineb</i> 10 (12) <i>snobeb</i> 12 (22) <i>sinbeb</i> 6 (2) <i>ʔisneb</i> 12 | <i>hisnib</i> 60 (64) | | |
| 2 | <i>snob</i> 'snob'/'he became snobbish' | | | | 92 (98) | <i>histaneb</i> 44 (36) <i>histnobeb</i> 6 (14) <i>hitsnobeb</i> 22 (38) <i>histnabeb</i> 4 (4) <i>hitsnabeb</i> 16 (6) |
| 3 | <i>talk</i> 'talcum powder'/'he sprayed with talcum powder (transitive)' | 72 (82) | <i>tilek</i> 26 (20) <i>tilkek</i> 46 (62) | <i>hitlik</i> 28 (18) | | |
| 4 | <i>marks</i> 'Marx'/'he "Marxicized" somebody' | 90 (98) | <i>mirkes</i> 28 (18) <i>mirkxes</i> 62 (80) | <i>himriks</i> 8 (2) | | |
| 5 | <i>marks</i> 'Marx'/ 'he became a Marxist' | | | | 100 (100) | <i>hitmarkes</i> 24 (18) <i>hitmarkses</i> 76 (82) |
| 6 | <i>patent</i> 'patent'/' he registered as patent (transitive)' | 100 (100) | <i>pitnet</i> 44 (32) <i>pitent</i> 56 (68) | | | |
| 7 | <i>šmalc</i> 'schmaltz'/' he made some- thing schmaltzy' | 36 (40) | <i>šimlec</i> 6 (8) <i>šimelc</i> 2 <i>šmilcec</i> 28 (32) | <i>hišmilc</i> 64 (60) | | |
| 8 | <i>šmalc</i> 'schmaltz'/' it became schmaltzy' | | | | 96 (100) | <i>hištamlec</i> 22 (20) <i>hišmalcec</i> 8 (8) <i>hišmalcec</i> 66 (72) |
| 9 | <i>zberg</i> 'blow'/' he gave a blow (intran- sitive)' | 32 (28) | <i>ziberg</i> 12 <i>zbǝggeg</i> 20 (28) | <i>hizbǝgg</i> 66 (72) | | |
| 10 | <i>ʔasfalt</i> 'asphalt'/'he covered with asphalt (tran- sitive)' | 96 (100) | <i>ʔisflet</i> 8 (2) <i>ʔisfelt</i> 88 (98) | <i>hisfilt</i> 4 | | |
| 11 | <i>sport</i> 'sport'/' he dealt with sport | 68 (56) | <i>sipret</i> 2 (2) <i>spirtet</i> 10 (4) <i>sportet</i> 56 (50) | | 32 (44) | <i>histapret</i> 4 <i>hitspartet</i> 4 (4) <i>histportet</i> 2 (4) <i>hitsportet</i> 22 (36) |

The findings of this test do seem to indicate that the desire to preserve the original consonant clusters of the source noun is indeed a significant factor, but that speakers tend to try to find ways of maintaining it without disturbing the general procedure for *binyan* choice outlined above.

The most obvious way of doing this is, indeed, by introducing reduplication in *pi²el*. Thus, since 3 is not a causative-over-inchoative, realization as *tilkek* leaves it in *pi²el*, where it belongs, without breaking the *lk* cluster, or rather the whole *tv²lk* pattern. Similarly, *hitšmalcec* in 8 and *sportet* in 11 preserve the structure of *šmalc* and *sport*, respectively, and are still realized in *hitpa²el* and *pi²el* respectively, the former being inchoative and the latter a non-inchoative non-reflexive intransitive. *Hitlik*, *hišmilc* and *hispi²rt* would have also preserved the original clusters, but as long as the speaker can find a way out, the basic procedure will normally prevail. Also, in all cases of *pi²el* and *hitpa²el* realizations except for 2, reduplicated forms OUTNUMBER others, since they can preserve the original without forcing a shift from one *binyan* to another. Another way, though not as common, of preserving original clusters in *pi²el* is by using the extended *ʔif²el* form, e.g. *ʔisneb*, *ʔišmelc*. It goes without saying that if the *binyan* chosen in the normal procedure preserves the structure of the noun without requiring reduplication, it will have preference over forms in other *binyanim* which also preserve that form—*hisnib* over *snobeb* and *ʔisneb*, in 1, *hišmilc* over *šmilcec* in 7 (both causatives-over-inchoatives) and *ʔisfelt* over *hisfelt* (non-causative transitive)—and obviously over forms in the same *binyan* that do not preserve the structure of the noun—*pitent* over *pitnet*, *ʔisfelt* over *ʔisflet*.

Another finding: the constraint that disallows expansion of a stem-final consonant into a cluster may be violated in order to maintain the normal procedure of *binyan* choice; thus, *hišmilc* is preferred to *šmilcec*. Furthermore, we already noted that within the same *binyan*, structure-preserving clusters have preference even in stem-final position (see *pitent* and *ʔisfelt* above).

Reduplication in *pi²el* is not the only new device, than; clusters may be preserved by simply allowing stem-final clusters, which is another significant change from recent innovations to our productivity test (except for *hišvūg*—cf. footnote 6).

Another way in which clusters are preserved in the test for which we have no evidence in recent innovations is the blocking of *hitpa²el* metathesis in certain cases. *Hitpa²el* metathesis, which metathesizes the *t* of the *hitpa²el* prefix with a following coronal obstruent (e.g. *hit+saper* 'have a haircut' > *histaper*) may be blocked in the process of verbalization in order to preserve a stem-initial cluster: *šmalc* is realized as *hišmalcec* oftener than *hišmalcec* or *hištamlec*, *sport* is realized as *hitsportet* oftener than any metathesized variant, and so on.

Each of these devices helps the innovator preserve the structure of the original noun without necessarily violating the established procedure for verbalization.

Concerning *hizbūg*, the normal procedure is violated here; as an intransitive verb, it should have been realized in *hitpa²el* or *pi²el*. It appears, however, that we are dealing here with a case of "sporadic analogy", which is quite obvious to any speaker of Hebrew, with the two recent derivations mentioned in (21) above:

| | | | | |
|-------------|--------|---|---------------------------|---------------|
| <i>flīk</i> | 'blow' | > | <i>hi²flīk</i> | 'give a blow' |
| <i>šmīr</i> | 'blow' | > | <i>hišmīr</i> | 'give a blow' |

which themselves may have been formed in analogy to native *hīrbīc* 'give blows'.

It seems to me that although it was preservation of original clusters that motivated forms like *hišpric*, *hiḥlik* or *hišvic* being chosen as realizations of *špric*, *ḥlik* and *švic* respectively, the third productivity test shows that switching to a different *binyan* to achieve this is not as likely any more if it involves deviation from the general procedure. In other words, it is possible that when *špric* etc. were realized as verbs, the general procedure was violated, but now that speakers are aware of other devices for preserving clusters, like reduplication in *piʔel*, they will not deviate from the general procedure if they can avoid it.

A final point: Ora Schwarzwald pointed out to me (personal communication), that except for *sport*, initial clusters show significant preference for *hiḥʔil*. I still feel, however, that although this seems to indicate priority of cluster-preservation over syntactic and semantic choice, the fact that all cases concerned function as causatives is not accidental, and that the behaviour of *sport* is the proof.

The results of test IV were again not significantly different from those of the "active" test, except that as in test II, most forms preferred in test III were supported even further, and that reduplication constituted a higher percentage of the cases, since some speakers were not aware of its potential unless they were actually reminded of it.

4.3. VARIATIONS IN HIERARCHY

Re-examination of the results of the four tests, primarily the less decided cases, where there was no clear predominance of one *binyan*, suggests that it may be possible to attribute the DISTRIBUTION of forms to some systematic strategies. For instance, when 60-70 percent of the speakers opted for *hiḥʔil* realization for causatives, the same 25 participants were consistent in making this choice throughout, and when *piʔel* was chosen for the same proposed meanings, in roughly 25-40 percent of the cases, 15 speakers were consistent in all cases but two (counting all four tests). Similarly, when 50-80 percent opted for non-inchoative non-reflexive non-habitual non-reciprocal intransitive realization in *piʔel*, 32 speakers were consistent about it in all cases but four, and most of the rest (15 except for four cases) consistently preferred *hitpaʔel*. A similar conclusion could be drawn from realization of non-causative transitives in *piʔel* (66%-100%—30 speakers consistent) or *hiḥʔil* (roughly 20%-30% except two cases—9 speakers consistent in all but two cases).

Since a considerable degree of consistency among speakers is involved even when the results show a clear split, it is very possible that there exist systematic differences in word-formation strategies among speakers of Hebrew. It was suggested to me by Yael Ziv (personal communication) that perhaps speakers differ systematically in some rearrangement or simplification of the hierarchy in (29) above. Interestingly enough, all the 15 speakers who were consistent in choosing *piʔel* for causatives were among the 30 opting for *piʔel* for non-causative transitives, and the 15 who preferred *hitpaʔel* for non-inchoative (etc.) intransitives were all included among those realizing inchoative (etc.) intransitives in *hitpaʔel*. In other words, it seems that for some speakers, the TRANSITIVE branch of the hierarchy was simplified to a single *piʔel* branch, and that for another group the INTRANSITIVE branch got simplified by one branch. The two fifteen-speaker groups overlap only partly (ten out of fifteen) which means that each of these simplifications could either be dependent on, or independent of, each other. Still, one could probably speak of something like "dialectal variation" in verb-formation strategies in Modern Hebrew.

5. CONCLUSION

It was shown here that the process of verbalization of nouns and adjectives is a complex one, involving syntactic, semantic and phonological considerations and requiring various global considerations. A verbalization-hierarchy of these factors was proposed on the basis of recent innovations, and was supported by means of productivity tests. It was claimed that although new strategies were introduced, they have not destroyed the essentially-semantic and syntactic base of the traditional theory of verb-formation, but rather built on it within its framework. It was also suggested that for some speakers, the system of verb-formation may be somewhat simplified.

APPENDIX I

SOME RECENT LITERATURE ON THE REALIZATION OF ROOTS IN THE DIFFERENT BINYANIM

A modern linguistic approach to *binyan* selection was attempted in Ariel (1972). His contribution lies primarily in providing a more precise definition of some of the relationships among realizations of roots in different *binyanim*, and in emphasizing the notion of change-of-state (ingressive, in his terminology) in capturing these relationships. Thus, he comments on the fact that *niḡʔal* often expresses change-of-state from *paʔal*, for instance *neʔemad* 'he stood up' vs. *ʔamad* 'he was standing', and that the *hiḡʔil* counterparts of the same *niḡʔal* forms will be corresponding causatives, for instance *heʔemid* 'he made (somebody) stand'. He further comments on the fact that *hitpaʔel* forms often indicate change-of-state from adjectives, for instance *hitkacer* 'it shortened' from *kacer* 'short', and that corresponding *piʔel* forms, like *kicer* 'he shortened' in our case (and obviously *kucar*, the *puʔal* form), are almost automatic.

Berman's (1975 a and b) attempt is considerably more comprehensive. Having examined all possible realizations of listed verbal roots, she establishes that the approximations of school grammars are generally supported, except for a few, though rather important, changes. She reaffirms the "independent" syntactic functions of the *binyanim* as specified above, except that *paʔal* is NOT the only base form—*piʔel* also is, since there are many *piʔel* verbs that do not have *paʔal* counterparts and certainly would not be derived from *paʔal* or from any other conjugation, and also because *piʔel* is very productive in innovations. With regard to semantic characteristics of groups of verbs realized in certain *binyanim*, her findings again confirm some of the specialized meaning-groups above, except that she would further classify some of them; for instance, change-of-state in *niḡʔal* is subdivided into change-of-state regular verbs—*neʔecar* 'stopped' and change-of-state copular verbs—*nehefax* 'became'. Also, she would add new groups and change ordering in terms of frequency; for instance, in *piʔel*, she would add a group of causatives, like *ximem* 'he warmed', and would give it preference over the "intensified *paʔal*" group.

A piece of work concerned essentially with productivity, that is, describing innovations rather than classifying all existing lexical items, is Sivan's (1963) doctoral dissertation. It is full of interesting information, but has one serious shortcoming: except for a few occasions, it does not distinguish between colloquial and literary innovations. This would not have been so problematic, had the literary illustrations been reasonably accepted in everyday usage; the difficulty is, that in some cases, primarily in the less productive *binyanim*, the majority of forms are the inventions of a particular writer which nobody else ever uses, and which in some cases are not even understood by anyone else. I do agree with some of his observations, particularly with *piʔel* becoming the most productive *binyan*, but not with the mixing of levels in some of his data.

Sivan is the only one to consider non-semantic factors, primarily phonetic, phonological and orthographic, in verb-formation. He claims, for instance, that the traditionally-basic

pa'al is no longer productive, not because most of its slots are "occupied", but because its unmarked past form is represented orthographically by consonants only, and contains no affixes (e.g. *kašar* 'tie' as k-š-r, *sagar* 'close' as s-g-r). The unmarked past form of *pi'el* does not contain suffixes either, but in Modern Hebrew orthography is represented with the sign *y*, which stands for either *y* or *i* (only *a* and *e* are NEVER represented in the modern orthography), which appeals to innovators. Sivan believes that innovators are heavily influenced by spelling, and that they prefer forms with distinguishing marks (such as affixes or vowels represented by glides in the orthography), partly because they themselves notice them more easily, but more importantly—because they wish readers to pronounce them as intended. They would use *pa'al* only in poetry, since in poetry the vowels are fully represented by diacritics. But notice that Sivan's argumentation here revolves around the written language, and even if he had the spoken language in mind, he still considers its representation in writing to crucially determine the choice of the *binyan*.

Concerning the amazing productivity of *pi'el*, and normally related *pu'al* and *hitpa'el* forms, as against other *binyan* patterns that do contain affixed and orthographically-represented vowels, Sivan's explanation is phonological. Quadriliteral roots—which in general were quite scarce in pre-Modern Hebrew—could only be realized in *pi'el*, *pu'al*, or *hitpa'el* when expanded into C₁CCeC, CuCCaC and hit+CaCCeC respectively. Furthermore, there existed a group of verbs in these *binyanim*, in which the first radical was reduplicated so as to begin the final syllable of the stem, e.g. *gilgel* 'he rolled (tr.)' (from the root g-l-l), *gulgal* 'it was rolled', *hitgalgel* 'it rolled (int.)'. Quadriliteral realizations were also formed with the increased productivity of the derivational prefix #šV+, which was ALSO restricted to these three *binyanim* only, the result being š_iCCeC (*š_i'bed* 'he enslaved'), šuCCaC (*š_u'bad* 'he was enslaved'), *hišta*CCeC (after metathesis; *hišta'bed* 'he became a slave'). Whether the reason was reduplication or increased prefixation, or because the root was quadriliteral to start with, the way was opened for further incorporation of quadriliteral roots in *pi'el*, *pu'al* and *hitpa'el*. In Modern Hebrew this trend considerably extended, particularly owing to the formation of a few more quadriliteral "sub-*binyanim*" in the three *binyanim* concerned: *š_i+CCeC* (*š_ivxen* 'diagnosed'), *ti+CCeC* (*tidlek* 'he fuelled') etc. (I mention *pi'el* only, but in most transitive *pi'el* cases, realization of the other two *binyanim* is also implied). So whether an actual fourth radical was involved, or a derivational affix was re-interpreted as part of the stem rather than as a *binyan* affix, the three *binyanim* concerned were partly reconstructed to allow four stem-consonants, and since these *binyanim* are the only ones allowing four consonants in the stem, they are naturally preferred when a noun containing more than three consonants is involved.

It is interesting, however, that Sivan fails to explain WHY four radicals could be possible in *pi'el* in the first place. There might be semantic reasons for each of the particular cases, but there are also systematic PHONOLOGICAL explanations. First, Pre-Modern quadriliterals were realized in *pi'el*, *pu'al* and *hitpa'el* in analogy to the (now lost) gemination of the second radical of these conjugations, e.g. *tirgem* 'translate' based on *dibber* 'talk', etc. Furthermore, as pointed out in 3.1.1 above, the disyllabic structure of *pi'el*, *pu'al* and *hitpa'el* stems can accommodate more consonants than can the monosyllabic stems of *hi'el* and the future of *pa'al*.

Concerning the question of why *pi'el* is more productive than *hi'el*, Sivan suggests, correctly, that denominative verbs tend to preserve the original form of the noun as far as possible. His argument is that the prefix *hi* of *hi'el* would tend to obscure that form more than the *pi'el* vowels do. As shown in this paper, the principle is valid, but I think the explanation here is weak—primarily because, as Sivan himself admits, *hi'el* sometimes preserves the original form of the noun in the best possible way, as in words like *hišpric* 'squirt', *hišvic* 'brag', *hišflik* 'hit', where the source nouns are *špric* 'squirt', *švic* 'bragging', and *flik* 'a blow' respectively.

APPENDIX II

SENTENCE FRAMES FOR TESTS I AND II (Proposed forms for test II in brackets)

1. hu _____ ^{oto} bekōax 'he made him sheriff by force (forced him to become sheriff)'
(širef hišrif šaraḡ nišraḡ hištareḡ)
6. ha^{ikar} _____ bekōrax hansibot 'the farmer became a vassal due to circumstances'
(vasal hitvasel visel nival hivasil)
11. hu _____ ^{et} hakim 'he covered the wall with panels'
(panal hitpanel hiḡnil pinel niḡnal)
5. bā^{al} ha^{axuza} _____ ^{et} ha^{ikar} 'the lord made the farmer a vassal'
(hitvasel vasal hivasil visel nival)
9. bemešex hazman hu _____ 'with the time he became an armchair revolutionary'
(silen hislin salan histalen nisan)
3. hu _____ becura lo xukit 'he illegally proclaimed himself sheriff'
(šaraḡ nišraḡ širef hišrif hištareḡ)
7. hu _____ ba^{axuza} šel habaron, ^{arba'im} šana 'he served as vassal at the baron's estate for forty years'
(hitvasel nival visel vasal hivasil)
8. hansibot _____ ^{oto} 'circumstances made him an armchair revolutionary'
(salan histalen nisan hislin silen)
2. hu _____ liḡney šnatāyim 'he became sheriff two years ago'
(nišraḡ hištareḡ šaraḡ hišrif šireḡ)
12. hu _____ ^{et} haxaka 'he fitted the fishing rod with a hook'
(keres karas hikris hitkares nikras)
10. hu _____ kol ha^{erev} 'he spoke revolutionary-style all evening'
(salan nisan silen histalen hislin)
4. hu _____ betēksas ad moto 'he served as sheriff in Texas till his death'
(hišrif šaraḡ nišraḡ hištareḡ šireḡ)

SENTENCE FRAMES FOR TESTS III AND IV (Proposed forms for test IV—in brackets. Very unlikely suggestions, like *hitpaʔel* forms for transitive realizations, or *piʔel* forms for inchoative verbs, were not proposed).

1. *hamaʔamad haxadaš šelo _____ ʔoto legāmre* 'his new status made him utterly snobbish'
(*sanab hisnib sineb snobeb sinbeb*)
3. *hu _____ ʔet haraglāyim šelo* 'he sprayed his feet with talcum powder'
(*talak tilek tilkek hitlik*)
8. *hašir _____* 'the song became schmaltzy'
(*šamalc hištamlec nišmalc hitšmalcec hišmilc*)
9. *hu _____ lo bekōax* 'he hit him (intransitive) with force'
(*ziberg zabarg hizbūg zbūggeg*)
2. *hu _____ legāmre* 'he became utterly snobbish'
(*nisnab histaneb histnobeb sanab hitsnabeb hitsnobeb histnabeb*)
4. *hu _____ ʔet xāyim* 'he "Marxicized" Chayim'
(*himriks mireks mirkes mirkses maraks*)
10. *hu _____ ʔet hakviš* 'he covered the road with asphalt ("asphalted" the road)'
(*ʔisfelt hisfilt ʔisflet*)
6. *hu _____ ʔet hahamcaʔa* 'he registered the invention as patent ("patented" the invention)'
(*hiŋtint piŋnet piŋtent*)
5. *hu _____ kvar mizman* 'he became a Marksist long ago'
(*hitmarkes hitmarkses hitmareks nimiraks*)
7. *hu _____ ʔet hasēfer* 'he made the book schmaltzy'
(*šamalc šimlec šmilcec šimelec hišmilc*)
11. *hu _____ kol hayom* 'he dealt with sport all day'
(*siŋpret histapret spiŋtet histportet sportet hitsportet hitspartet histpartet*)

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The Ayt Ndhir dialect which is described belongs to one of the major Berber languages, Tamazight, spoken in the Middle Atlas Mountains of central Morocco. The description is based in the main on research undertaken with native speakers of the Ayt Ndhir territory surrounding El Hajeb. — While directed to the non-specialist, a number of points in the description proper will be of interest to the specialist as well: the presentation of noun and verb morphology points up a number of regularities which more often than not have been obscured in previous descriptions. Also, phonological rules are given which account for the major share of morphophonemic complexities. The reader will find in the appendices and 'optional' sections conjugation tables of typical verbs—including detailed observations on the placement of shwa in verbs —, a chart showing the main morphological patterns involved in verb derivation, a description of the phonological rules applying in complex sequences of morphemes of the verb group, the 'basic' vocabulary contained in several well-known lexicostatistic word lists, and a chart of the Tifinay alphabet used by the Tuareg.

AAD 2 - Ancient Egyptian: *MIDDLE EGYPTIAN* by John Callender. 1975, 150 pp., \$10.

This grammar deals with the literary language used in Egypt from ca. 2000 to 1200 B.C. and considered in even later times to be the classical written form of Egyptian. The book is directed toward the general linguist as well as the Egyptologist; examples are glossed and written in transcription and there is an index of grammatical terms and Egyptian morphemes. A comprehensive set of paradigms of both verbal and non-verbal predicate types is included as an appendix, together with an appendix on negation and one on the historical origin of certain constructions.—The grammar contains three main parts: phonology, morphology, and syntax, of which the last receives most emphasis. The section on phonology sketches the laws of sound change to the extent they can be discovered. The section on morphology stresses the paradigmatic character of verb tenses and their derivations. A distinction is made between truly paradigmatic tenses and tenses borrowed from Old Egyptian for quotations or special effect. Following Polotsky, the "emphatic forms" are treated as nominalizations under the rubric "manner nominalizations." Unlike previous grammars of Egyptian, this grammar discusses syntax according to transformational categories. The process of "clefting" interrelates emphatic forms, the "participial statement" and constructions with *pw* + relatives. The process character of negation is emphasized, and the implications of so considering it are developed in a special appendix. A sample text is also included, accompanied by a vocabulary and a translation.

AAD 3 - Semitic: *DAMASCUS ARABIC* by Arne Ambros. 1977, vii-123 pp., \$13.

Based on both previous works and the author's own observations, the grammar describes the Sedentary Eastern Arabic dialect spoken in Damascus. While strictly synchronic and written without presupposing knowledge of classical Arabic, it follows traditional arrangement and terminology as closely as possible without failing however to do justice to the individual traits of the dialect. Appendices deal with 1) the regular reflexes of Classical Arabic phonemes in Damascus Arabic, and rules governing the reduction of vowels, and 2) a discussion of morphological substitutions which cannot be interpreted as describing the historical development from Classical Arabic to Damascus Arabic.

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This article presents a preliminary picture of the 1973-1975 excavations of the Tell Mardikh Royal Palace G dating to Early Bronze IVA (ca. 2400-2250 B.C.). It was in 1975 that some 15,000 cuneiform tablets and fragments were found in the palace, some of them written in a new North-Western Semitic language. The various sectors of the palace thus far excavated are described and the building is placed within its chronological and historical framework. Ceramic evidence pertaining to the chronology is published here for the first time. The paper (given here in a translation by Dr. Frances Pincock) was read at the 24th Rencontre Assyriologique Internationale at Birmingham in July 1976.

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